

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/21218

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| <b>A. CLASSIFICATION OF SUBJECT MATTER</b>   |   |  |
| IPC(7) : B24B 31/02<br>US CL : 451/113   |   |  |
| According to International Patent Classification (IPC) or to both national classification and IPC  |   |  |
| <b>B. FIELDS SEARCHED</b>  |   |  |
| Minimum documentation searched (classification system followed by classification symbols)<br>U.S. : 451/32,103,104,113,326,327,329   |   |  |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  |   |  |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)   |   |  |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>  |   |  |
| Category *   | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No.  |
| A  | US 3,524,735 A (OETIKER) 18 August 1970 (18.08.1970)  | 1  |
| A  | US 3,579,920 A (HEIBERGER) 25 May 1971 (25.05.1971)   | 1  |
| Y  | US 3,855,740 A (KOBAYASHI) 24 December 1974 (24.12.1974), see entire reference, specifically figure 1.  | 1  |
| Y  | US 5,355,638 A (HOFFMAN) 18 October 1994 (18.10.1994), see entire document, specifically figures 2A and 2B.   | 1  |
| Y  | US 5,848,929 A (HOFFMAN) 15 December 1998 (15.12.1998), see entire document, specifically figures 1 and 2.  | 1  |
| <input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.  |   |  |
| <b>* Special categories of cited documents</b>   |   |  |
| "A"  | document defining the general state of the art which is not considered to be of particular relevance  | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  |
| "E"  | earlier application or patent published on or after the international filing date   | "X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone   |
| "L"  | document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |
| "O"  | document referring to an oral disclosure, use, exhibition or other means  | "&" document member of the same patent family  |
| "P"  | document published prior to the international filing date but later than the priority date claimed  |  |
| Date of the actual completion of the international search<br>27 October 2003 (27.10.2003)  |   | Date of mailing of the international search report<br>10 NOV 2003  |
| Name and mailing address of the ISA/US<br>Mail Stop PCT, Attn: ISA/US<br>Commissioner for Patents<br>P.O. Box 1450<br>Alexandria, Virginia 22313-1450<br>Facsimile No. (703)305-3230 |   | Authorized officer<br>Timothy V Eley<br>Telephone No. 703-308-1148<br><br><i>Sheila H. Verney</i><br>Patent Specialist<br>Tech. Center 3700  |